

## ***Interactive comment on “The influence of tropical Indian Ocean warming and Indian Ocean Dipole on the surface chlorophyll concentration in the eastern Arabian Sea” by Syam Sankar et al.***

### **Anonymous Referee #1**

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The tropical Indian Ocean warming and Indian Ocean Dipole on the surface chlorophyll concentration in the eastern Arabian Sea is an important topic. This paper shows that the increased IO warming and positive IOD events causes the decreasing trend of Chla in the southeastern AS. But earlier studies ( for example, Currie et al., 2013; Wiggert et al., 2009, 2006; Murtugudde et al., 1999 ) documented about the role of IOD on the chlorophyll variability in the EAS especially during fall. Their study also discussed the reason for Chla variability during the IOD events. In this context, how your study is different from their study. You need to justify it. Explain the mechanism and processes which lead to the asymmetrical warming, and how it favors the formation of frequent positive IOD years. Content comments Abstract P1, line 15: Why you limited your

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study period up to 2014 when chlorophyll data is available up to the end of 2018 ? P1, lines 22-15: How you can say that the occurrence of positive IOD years under a global warming regime affect the chlorophylla trend. To confirm that find the rate of warming and associated chlorophyll variations when the IOD events are absent and compare it with the period when IOD events are frequent. I believe that the decreasing trend of chlorophyll is more related to the increasing water column stratification rather than the IOD events; however, inter-annual variability might be contributed by the IOD events. Data and Methodology You are discussing about IOD and El Nino–Southern Oscillation in the Introduction, but ENSO contribution towards the Chla variability is not addressed in the ms. Why your study is restricted only up to 2014 ? P 5, lines 15-23: replace “p” with “rho” . Similarly, symbol used for wind curl and geostrophic current is also wrong. Please use correct symbol. Result P5, line 27: What basis you have taken SST trends from 1981 onwards; not before 1981; and why it is restricted up to 2014 when data is available up to the recent year? P 6, line 18 : What basis you said that 2012 is the strongest IOD year during the study period. I feel 2006 is the strongest. Cross check it with DMI index. P7, line lines 1-2 : Sentence is not correct. P8, line 20: Can you show time series of D20 in your boxes ? P8, line 10: conductive ? I think wrongly written Conclusion In your conclusion you have mentioned that asymmetrical warming favoring the formation of frequent positive IOD years. Is it your result ? If so, I have not seen this part discussed elsewhere in the ms. Which is very important. Why EAS shows higher warming than the western AS ? Can you show an SST trend of western AS in the same period ? Page 10, line 18: is it nest ? Figure 3. When Chla trend in all the three boxes are not significant, why the study is important?

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